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ABSTRACT

The purpose of this study is to identify university faculty concerns along with the degree of use of Web-based course tools to develop faculty support programs. The study borrows from both the Diffusion of Innovations Model (Rogers, 1983) and the Concerns Based Adoption Model (Hall & Hord, 1987) to develop faculty support programs that will help early adopters implement Web-based courses and nurture later adopters as they consider the use of these tools in their teaching. A Stages of Concern questionnaire was distributed to 928 faculty members in December 1998, with a 16% response rate. A second questionnaire was administered in December 1999, yielding a response rate of 37%. Between the first and second administrations of the questionnaire, some faculty members attended workshops on how to use Web-based course tools. Faculty who taught with a Web-based course also completed a survey to identify which Web-based tools they used and the degree of use. Results indicate a need for staff development not only in the technical areas of the Web-based tools, but also in other relevant areas. There is a need to provide faculty with organizational incentives and other support, and to acknowledge cultural traditions of education, to help them overcome conflicting feelings about technology. Support for early adopters is crucial to the success of online course development. (Contains 12 references.) (AEF)

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A Study of Faculty Concerns and Developmental Use of Web Based Course Tools

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Objectives

Colleges are feeling pressured to develop Web based courses using online course tools (online syllabi, online gradebooks, bulletin boards, chats etc). Yet, resistance and opposition to using these technologies have become apparent because of concerns about course quality and appropriateness for classroom use. The purpose of this study is to identify university faculty concerns along with the degree of use of Web based course tools to develop faculty support programs. The study interprets the degree of faculty use of the various online tools in light of implementation concerns and the change process one progresses through when implementing an educational innovation. This study applies research involving educational and technology change efforts to faculty use of Web based tools in order to develop effective faculty development in this rapidly expanding area of Web based education.

Theoretical Framework

Resistance to instructional communications technology can be understood when educational change theories are applied (Blumhardt & Cross, 1996; Cuban, 1993; Klein, 1995). These theories assert that change is a long term process that if properly supported progresses beyond early adopters. Neglecting faculty beliefs about the rapid developments in technology and uses for instruction often leads to limited implementation (Cuban, 1998; Cummings, 1995; Freberg, 1995; Hansen & Perry, 1993;). This study borrows from both the Diffusion of Innovations Model (Rogers, 1983) and the Concerns Based Adoption Model (Hall & Hord, 1987) to develop faculty support programs that will help early adopters implement

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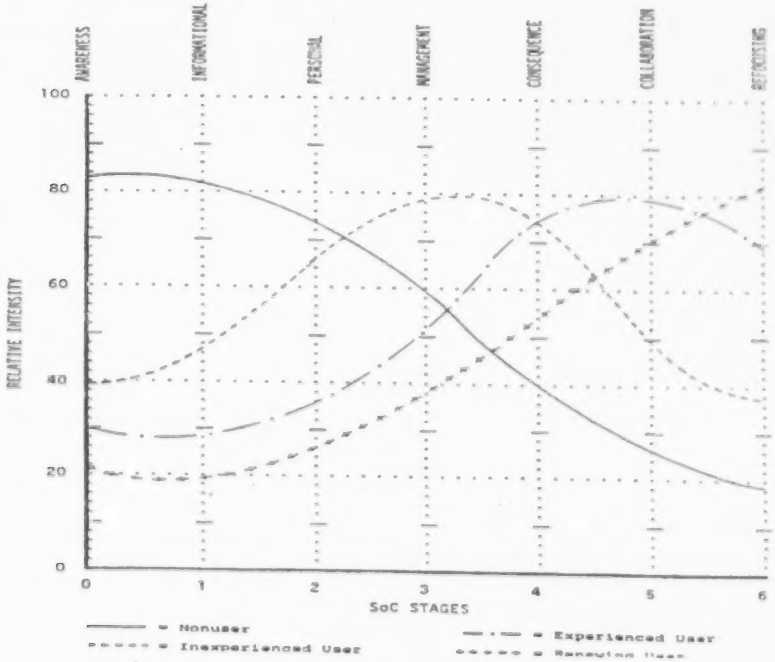
Web based courses and nurture later adopters as they consider using the Web based tools in their teaching.

Research on the developmental stages of user concerns regarding an innovation tells us that these concerns progress from self, to task, and then to impact. By overlooking low level concerns, these low level concerns intensify. By alleviating concerns specific to a stage of use, the user is able to move to higher levels of implementation (Hall, Wallace, & Dossett, 1973). This model assumes educational change is a process and takes time; that individuals, not the institution, are the primary focus of change; and that there are identifiable phases and stages of the change process. A 35 item Likert scale instrument measures the current degree of concern and reports results in terms of seven stages of concern about the innovation. The seven stages are: Awareness (little concern); Informational (unworried about one's involvement, interested in learning more); Personal (implications for oneself); Management (organizing and time demands); Consequence (impact on students); Collaboration (coordination with others); and Refocusing (improvements). Hypothesized stages of concern can be seen in figure 1.

Figure 1. Hypothesized development of stages of concern

Hypothesized development of stages of concern



Combining Hall and Hord's research with Rogers' theory, recommendations for faculty development programs are presented based on faculty stages of concerns and Rogers' research on early adopters and their degree of use.

According to Rogers, it is only with regular and frequent use of the communications innovation, that diffusion efforts will be successful (Rogers 1986). Rogers' research implies that as these early adopters become confident and proficient with Web based course tools, they will by their own example and personal influence become "opinion leaders" and encourage more reticent faculty to explore the various online course tools (Harris, 1997). Rogers developed a bell shaped diffusion curve in which he identified: Innovators (users independent of institutional support, up to 3%); Early Adopters (users that combine interest with competence, 10%), Early Majority (need proof that innovation is proven, 35%); Late Majority (must be convinced, 35%); and Laggards (lead opposition, 17%).

Rogers (1986) also wrote that communication technology tools can be used in many different ways and for different purposes that involve "re-invention" (the degree to which its use is modified). Successful implementation requires faculty development that will encourage personalized use of these Web based course tools to meet specialized needs. This need is included in the faculty development training and support recommendations.

In response to criticisms that some diffusion research has been post-hoc, this study uses process research. Faculty have responded to questions that measure awareness and concerns about the complexities involved in the implementation of Web based course tools, even before they have considered using these tools.

Methods

This study examined Web based tools used to supplement face-to-face class instruction (hybrid use). A baseline measure of faculty Stages of Concerns about supplementing traditional class meetings with Web based course tools was obtained in December 1998, prior to implementation by early adopters. The 35 item Likert type questionnaire, developed by Hall, George, and Rutherford (1986), was distributed to all full time faculty members, including a handful of "innovators," in December 1998. This questionnaire was administered again to all full time faculty in December 1999. During the year between the first and second administrations of the questionnaire, some faculty members attended numerous workshops in which they learned how to use the various Web based course tools. In addition Web based courses in Virtual-U or WebCT were set up for those who were interested. These initiatives were aimed at enabling faculty to explore the different

features of Web based courses and use the course tools (online syllabi, online gradebooks, bulletin boards, chats etc.) during the Spring 1999, Summer 1999 and Fall 1999 semesters.

To identify changes in the intensity of the seven stages of concern, the raw scale scores of the December 1998 (pre early adopters) and December 1999 (post early adopters) were converted to percentile scores based on the tables devised by the developers of the questionnaire. The tables and processes were automated for ease and flexibility of use. The percentile scores were graphed separately on the same axes for visual comparisons. Statistical comparisons of the raw scores were used to determine if significant changes had occurred. The percentile scores for 1999 were also grouped into the following ranges and graphed separately to highlight the intensity of concerns at each stage: very low (0 -19); low (20 - 39); moderate (40 - 59); high (60 -79); and very high (80 -100).

In addition to the Stages of Concern Questionnaire, faculty who taught with a Web based course (innovators and early adopters) also completed a 38 item Likert scale survey to identify which Web based tools they used with their students and the degree of their use. These include management tools (setting up, organizing, and editing course materials), communication tools (asynchronous and synchronous communication), electronic submission tools (assignments and assessments), and feedback tools (gradebook and grade reports/charts. The results of faculty use of the Web based support tools are explained by examining traditional faculty roles, their stages of concern, and Rogers' Diffusion Theory.

Data Source

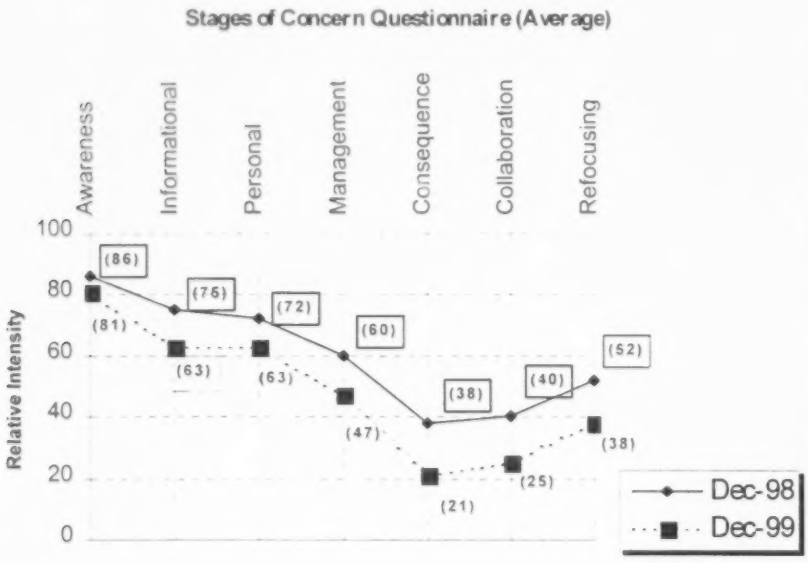
The Stages of Concern questionnaire was mailed to 928 faculty members in December 1998, at the end of the fall semester. There were 149 usable responses, representing a response rate of sixteen percent. This rate, although low, was not unexpected considering most faculty were unaware of this innovation at this time. A preliminary administration of the survey on degree and ease of use of Web based tools, elicited a total of eighteen responses, an indication of the negligible level of adoption of these tools. The follow-up Stages of Concern questionnaire in December 1999 elicited a similar response rate. The second administration of the survey on degree and ease of use of Web based course tools, was limited to 65 faculty members who had accounts for Web based course tools. The overall

response rate for this survey was 37 percent, with one-half of the respondents indicating that they had not started using the course tools.

Results

Raw scale scores from the December 1998 and 1999 administrations of the Stages of Concern questionnaire were converted into percentiles and are shown in figure 2.

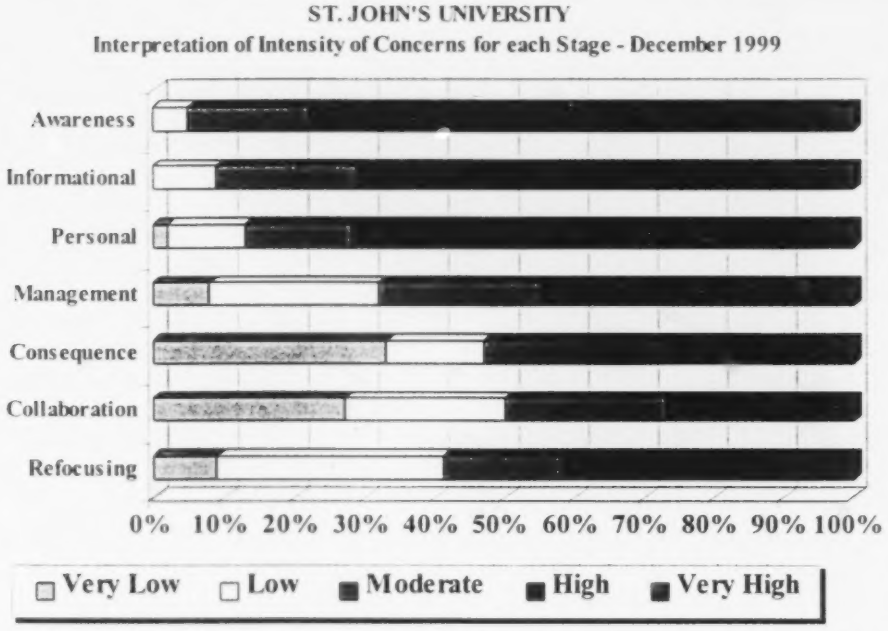
Figure 2. Stages of Concern for December 1998 and 1999



For both years 1998 and 1999, the profile of the respondents was consistent with the nonuser concerns profile illustrated earlier. The highest score was obtained for awareness, followed by information and personal concerns. These results suggest that faculty are aware of and are interested in learning more about Web based tools. However, they also have personal concerns in relation to the innovation. Significantly lower scores on the other stages are also consistent for nonusers (pre adopters), indicating that faculty do not have a great deal of management concerns, and are not unduly concerned about the consequences of the innovation on students. However it is interesting that the last two stages (Collaboration and Refocusing) increase rather than decrease which is not typical of early users. Rather than having less concerns about collaborating with others, the graphs show a slight increase. More unusual are the higher scores (low to moderate) for refocusing concerns.

The nonuser profile is also illustrated in figure 3, which highlights and interprets the ranges of intensity of concerns for respondents in December 1999.

Figure 3. Intensity of concerns for each stage - December 1999



Results of the faculty survey on the frequency of use of the various features available within the two online course tools found that the features used most often were: uploading files from one's own computer; editing the course files; adding links to Web sites; and using conferences or bulletin boards. Features with the lowest reported use were using images, developing a glossary, and using the gradebook.

Interpretations

Most of the faculty that responded to our Stages of Concern Survey are at the beginning of the change process and have high awareness, information, and personal concerns. They are concerned about getting information about using online course tools and how using them will affect them personally. Faculty concerns typify users who want to have the innovation fit the traditional style of teaching (teacher centered). Personal concerns may be particularly high because using online course tools challenge the professor's role and control that are characteristic of the higher education lecture class. Also, prior experiences with technology equipment failure probably contribute to heightened personal concerns and reluctance to adopt this innovation.

The online tools that faculty used with some frequency are consistent with the view that historically technology has been used to give a better lecture. That is, technology has been commonly used to prepare (word processor) and deliver (overheads and PowerPoint) lecture instruction. An inspection of the tools that were most commonly utilized also reflects preservation of the existing lecture mode. Specifically, the online course tools were used to provide a more efficient way to distribute student handouts (uploading files and Web links). Whether the asynchronous features (conferencing and bulletin boards) were used to change the teacher-to-student interactions remains to be seen.

The online tool features with the lowest use are also not surprising. Using images in the course tools requires additional skills and software to convert file formats to those compatible with the Web (GIF and JPG). Developing a glossary may not be a priority as it is time consuming and glossaries are often contained in textbooks. It was interesting that the gradebook, more immediately beneficial to students, was not used frequently. Having grades readily available to students would be a new dynamic and does demand attention on a frequent basis. The fact that developing and utilizing online course tools is time intensive and does not contribute to the higher education incentive system contributes to its limited use.

The slight increase in refocusing concerns was unexpected but may be attributable to the fact that unlike other innovations, faculty do not have to use the entire package to be considered users. Many faculty limited their use to just a few Web links or uploaded files. Having used these basic features they may be reflecting on how they could change their courses by using the other features. Other innovations may require use of a whole package and not selective features.

Recommendations

Results clearly indicate a need for staff development not only in the technical areas of the Web-based tools, but also in other relevant areas. For example, faculty development has to focus on ways of alleviating personal concerns among some faculty in order to ensure acceptance of the innovation. There is a need to provide faculty with organizational incentives and other support, and to acknowledge cultural traditions of education, in order to help faculty members overcome conflicting feelings about rapidly changing technology.

Rogers' Diffusion Theory suggests that support for early adopters is crucial. If the early adopters are not supported and feel that the time invested in developing online courses is not worthwhile in terms of student learning and professional rewards, this innovation will fail. In order to avoid unimaginative and limited use of Web based instruction, support of early adopters is needed so that these "opinion leaders' can share positive experiences with the vast majority of the faculty. Rather than spreading limited support across large numbers of faculty, it is recommended that faculty support programs target the early adopters through the following: summer grants to develop online hybrid courses, create a users group for early adopters to meet and share experiences on a regular basis, and invite faculty experts from other universities as well as online course designers to meet with this group for additional support. These user groups should begin by addressing concerns about the demands, rewards, and potential conflicts for oneself and then progress to issues of how to best use the online tools themselves. It is also important to include faculty who are using only a few of the online tool features in the early adopters group. Unlike other teaching innovations, one can selectively choose some tools to use, reflect on how to improve use and over time develop confidence to expand into other tools. These faculty can share their experiences and encourage faculty in the majority (early and late) who might have concerns that adoption might be too demanding.

We plan to continue administering both the Stages of Concern questionnaire, and the survey on degree and use of Web based course tools annually. Repeated administration should allow us to track the diffusion of the innovation and the impact of intervening faculty development efforts.

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